

Claims

1. Hybrid synchronous motor with toroidal winding comprising:
5 a rotor and a stator,
the stator having at least one assembly (7) of coaxially
displaced ferromagnetic rings (2, 3) which are cogged both on inner
and outer circumferences thereof, and
the assembly (7) being provided with a polyphase toroidal coil
10 (6) made of coil segments so that a coil wire is lying between cogs (2a,
3a, 2b, 3b).

2. A hybrid synchronous motor according to claim 1, wherein a
plurality of the stator assemblies (7) have a common toroidal coil
15 which is formed around all of them simultaneously, and wherein the
common toroidal coil is wound around or assembled from U-shaped
copper parts.

3. A hybrid synchronous motor according to claim 1 or 2, wherein
20 one pair of inner and outer rotor assemblies (16a, 16b) is mounted to
each stator assembly (7), each stator assembly including two
coaxially displaced rotor rings (17a, 18a or 17b, 18b), each rotor ring
is being formed with rotor poles in the form of cogs which are equally
spaced along a circumferential direction, so that the poles of each of
25 the rotor rings (17a, 17b) are angularly shifted for one half of rotor
pole division relative to the poles of the other corresponding one of
the rotor rings (18a, 18b), respectively.

4. A hybrid synchronous motor according to any one of claims 1
30 to 3, wherein
either one axially magnetized disk is inserted between the

cogged stator rings (2, 3) of each assembly (7), or two such disks are inserted between the adjacent cogged rotor rings (17a, 18a) and (17b, 18b), and wherein

5 the disk or the disks are producing transverse magnetic flux in the inner and in the outer air gaps between the rotor and stator.

5. A hybrid synchronous motor according to any one of claims 1 to 4, wherein

10 four sets of rotor poles (19a, 19b, 20a, 20b) have the same number of poles, and four sets of stator poles (2a, 3b, 3a, 3b) also have the same number of poles, but these two numbers slightly differ if the stator poles are equally spaced along a circumferential direction.

15 6. A hybrid synchronous motor according to claim 1, wherein the gaps between rotor and stator are filled with a liquid, preferably ferromagnetic liquid which improves heat transport from motor interior and reduces mechanical vibrations.